union

Integrating technologies for live audio events

MIXING | PROCESSING | DISTRIBUTION | RECORDING | AMPLIFICATION | LIGHT | CONTROL

UNION [ju-ni-on] - *the act or the state of being joined together.*

Live event technology is constantly changing - offering more creative possibilities every year. One of the major changes in the past decade is the shift from single-use products to complex integrated systems, joined together by networking technologies. Leading the market as front-end implementor of these technologies, we believe in creating the most open systems possible. That's why we now present the UNION philosophy.

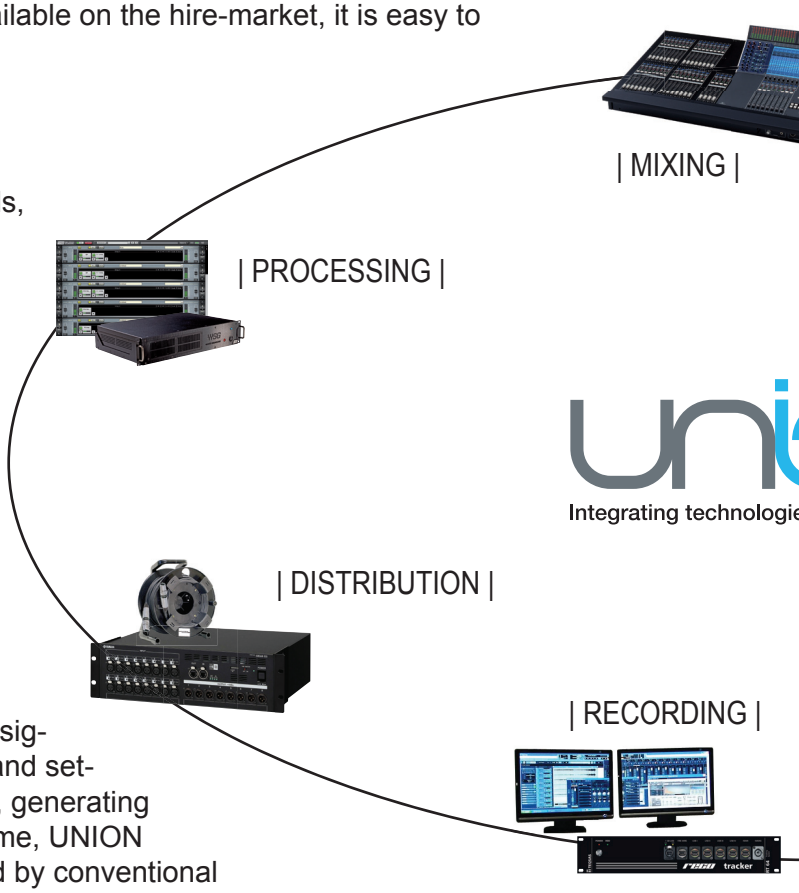
UNION is a design philosophy - offered to the market as turnkey systems by Yamaha system integrators. UNION offers freedom to design any live audio system without being constrained by a limited product line-up or a single manufacturer. Freedom to integrate with lighting, video, recording and processing technologies. Whatever shape your live event takes, Yamaha systems are always open to growth and change, connecting to an open-platform of networked components.

| MIXING |

Any number of Ethersound compatible mixing consoles can be used in a UNION system, including all MY16 compatible consoles on the market: 01V96, DM1000, DM2000, LS9, PM5D and M7CL. Investments can be done incrementally as existing MY16 compatible mixing consoles can be upgraded to integrate with a UNION design at low cost by just adding the Ethersound interfaces. As over 100.000 MY compatible mixing consoles are available on the hire-market, it is easy to expand a system temporarily by hiring a console.

| PROCESSING |

Yamaha mixing consoles offer full DSP for all channels, mixes and internal processing racks simultaniously. Further Yamaha DSP can be included through the Ethersound network using multiple DME Digital Mixing Engines. In addition, the M7CL48-ES console supports a further 48 channels of digital i/o for connection with peripherals such as the Waves Soundgrid Server: 16 or 32 plug-in strips can be used simultaniously. Waves Soundgrid offers complete plug-in bundles for live use that are already familiar to Waves Multirack and Digidesign users.



| DISTRIBUTION |

UNION supports a full networked system design that significantly increases the efficiency of touring logistics and set-up compared to analogue and point-to-point systems, generating cost benefits for the investor and user. At the same time, UNION disposes of virtually all distribution constraints caused by conventional cabling, allowing sound designers to expand their creative design options. Placement of components is irrelevant - components can be connected anywhere in any order within the network's channel bandwidth.

| RECORDING |

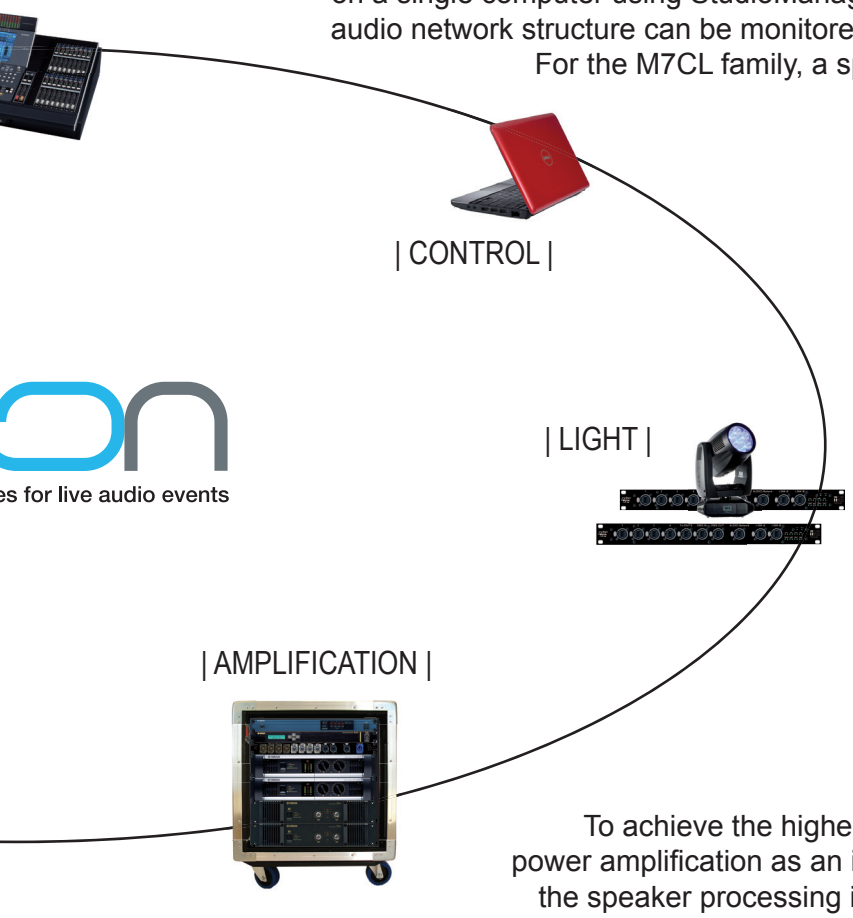
UNION offers up to 64 track live recording. Not as an option, but as a standard. Without any additional hardware, making use of the M7CL48-ES 3rd port ASIO driver developed in collaboration with Auvitran and Steinberg. Any Windows PC or laptop with any ASIO compatible recording software can be connected directly to the M7CL48-ES - with the only hardware needed being the CAT5 patch cable. For heavy duty touring, redundant RAID PC frames are available.

The UNION design philosophy introduces standards and conventions on audio protocols and levels in order to get the most out of a system's audio quality and efficiency. One convention is that for every audio connection in the system only one AD convertor and only one DA convertor may be passed, ensuring the highest dynamic range and lowest distortion possible.

Yamaha sytems utilise SB168-ES and AD8HR to interface with the analogue world, achieving an extremely high audio quality using Yamaha's state-of-the-art AD and DA convertors, excellent sounding microphone pre-amps, rock-solid clocking circuits, the world's most powerful 58-bit fixed point DSP platform and carefully designed electromagnetic and mechanical characteristics with an undisputed reliability track record. The performance level of a UNION-based system using Yamaha components is unmatched by any other system on the market.

| CONTROL |

Networked system control becomes standard functionality in a live system. UNION includes Gigabit network infrastructures - including wireless access points - to provide control and monitoring through any ethernet based software using a PC or laptop. Yamaha mixing consoles, Digital Mixing Engines and amplifiers can be controlled and monitored on a single computer using StudioManager, DME Designer and Amp Editor software. The audio network structure can be monitored and controlled by Auvitran ESmonitor software. For the M7CL family, a special app has been designed for the Apple iPad.



es for live audio events

| LIGHT |

UNION uses a redundant ring network, with the choice to use segments as Gigabit connections offering additional bandwidth over the CAT5 or fibre cable for other audio connections, or for non-audio functionality such as DMX512, ArtNET, IP-video and any other ethernet based communication protocol. This allows a single cabling system to be used by all functions of a live event system, increasing system efficiency to a new unprecedented level.

| AMPLIFICATION |

To achieve the highest dynamic range, UNION based systems include power amplification as an integrated part of the system by default. Including the speaker processing in the network domain, UNION offers a significant signal to noise ratio improvement compared to analogue interfacing with speaker processors. Applying the 0dBFS level structure - already used in the mixer and distribution sections of a system - to a system's speaker processors and amplifiers further improves the system's overall dynamic range, and makes it impossible for the amplifier and speaker to clip. UNION supports any ethernet based speaker management system, including Yamaha's Amp Editor and DME designer applications. Yamaha's DME Digital Mixing Engines and TXn series amplifiers offer preset speaker processing configurations for many of the world's speaker brands - including the full range of Yamaha IS series speakers, but also models from Martin Audio, JBL, Electro-Voice, TurboSound, EAW, Tannoy.

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system design briefing.

MIXING	Systems can include any number of mixing consoles. Yamaha DSP7 based mixing facilities include full capacity for all mixing channels and mix buses available simultaniously, including 4-band PEQ and two dynamic processors for all input channels, 4-band PEQ and dynamics for all mix buses, a DSP rack with up to 16 graphic EQ, up to 4 stereo effect processors / VCM plug-ins. I/O routing to the Ethersound network, local i/o and MY slots (M7CL48-ES)
PROCESSING	Systems can include any number of processing units. Yamaha DSP7 based processing uses a 32/58-bit fixed point DSP platform for all system components. Distributed DSP by DME Digital Mixing Engines with programmable functionality, including delay matrix mixers, feedback suppression, speaker processing, routing, parametric and graphic equalisers, multi-band dynamics, FX processing. Additional live-plug-in processing is supported through Waves SoundGrid MY interface cards and servers.
DISTRIBUTION	64-channel redundant audio distribution through any combination of EtherSound compatible mixers, i/o stageracks, DSP frames, and AES/EBU bridges. Additional networked audio distribution is supported as option through MY card slots, including CobraNet and Dante protocols to a maximum of 48 i/o channels for M7CL-ES.
RECORDING	Up to 64-channel network recording (up to 48 network inputs, up to 16 mixer outputs) is supported as a standard (M7CL48-ES) without the need for any additional hardware. Any Windows PC or laptop can be used. A dual harddisk (RAID) recording system is offered for touring applications. Further recording options are supported through MY interface cards for Ethersound, Dante, MADI, AES/EBU, Adat.
AMPLIFICATION	A standardised 0dBFS system eliminates output system level mismatches, amp clipping and speaker clipping. Output systems are offered as subsystems (NIOS - Network Integrated Output Systems) wich connect directly to the network. NIOS systems include DSP and offer all connections on a unified front-access panel for increased efficiency.
LIGHT	Segments in a redundant ring can be designed as Gigabit link, offering integrated connectivity for additional ethernet based media systems such as Video and light control. Gigabit links offer DMX512/ArtNET client/servers as option.
CONTROL	StudioManager, DME designer, Amp Editor, ESmonitor and further 3rd party ethernet based control systems use Gigabit links to integrate all control functionality in the system for mixers, DSP, speaker management and network monitoring. Multiple WIFI access points are supported. M7CL live control is supported through an iPAD application.
EFFICIENCY	Efficient touring logistics and set-up procedures are supported through standardised CAT5E and fibre cabling. Components can be connected anywhere in any order, scaled to the project requirements on a day-by-day basis.
INCREMENTAL	Incremental system investments are supported - components can be added in time as they are needed in pace with performance requirements. A high degree of compatibility and the massive market presence of compatible consoles, engines and stageracks allows systems to be temporarily expanded easily by hiring components on the market. All existing MY16 compatible Yamaha mixing consoles can be upgraded for use in a UNION (networked) system.
QUALITY	An extremely high overall audio quality performance is guaranteed by optimising the audio distribution methods in the digital domain - with each signal passing AD and DA only once through high quality 24-bit AD and DA conversion and microphone pre-amps with rock solid digital clocking circuitry, 32-bit peripheral architecture, 32/58-bit fixed point DSP platform, audio-dedicated power supply design, and CE compliant electromagnetic shielding.
REDUNDANCY	The ethersound ES100 redundant ring topology offers the highest redundancy level on the market, covering all individual cables and ES100 network nodes in the system. Aditionally, seperate Ethernet redundancy schemes for further redundancy for audio and ethernet connections are offered by Gigabit links.
COMPATIBILITY	UNION is based on EtherSound, including EtherSound components from Yamaha, supporting EtherSound components from other manufacturers (see www.ethersound.com for a listing of Ethersound partners and products). UNION offers additional support for connectivity over CobraNet and Dante through Yamaha interface cards. Non-licensed audio networks such as OptoCore, Rocknet, and point to point connection formats such as AES/EBU, Adat, MADI, LightViper, AVIOM are also supported through Yamaha and 3rd party interface cards.

COMPONENTS		
	M7CL48-ES	Networked digital live mixing console, 48 channels, 16 mixbus, 8 matrix, Centralogic
	SB168-ES	Stagebox, EtherSound, 16 inputs, 8 outputs
	NAI48-ES	AES/EBU bridge, 48 channels
	AD8HR, DA824	AD module: 8 analogue in to AES/EBU, DA module: MY8 slot to 8 analogue out.
	DME-ES	Digital Mixing Engines, 16ch EtherSound i/o
	DME-N	Digital Mixing Engines, MY16 slot i/o
	MY16-ES64	EtherSound interface for all Yamaha MY16 compatible consoles & engines.
	XP series	Power amplifiers, GPI control and monitoring
	Tn, PC01n series	Power amplifiers, RS485 control and monitoring
	TXn series	Power amplifiers, DSP, MY slot, Ethernet control and monitoring
	ACD1	Networked amplifier control device
	NIOS	Network Integrated Output Systems - subsystem with processing & amplifiers
	PA systems	IF series 2-way speaker systems: 8",12",15" - IS series subs: 12", 15", 18"
	recording frames	64 channels RAID live recording PC - Steinberg Nuendo DAW
	WAP	802.11 N,G wireless access points, gateways
	CyberTEQ	(by Teqsas) Gigabit link modules, 3 VLANs, Link aggregation
	DMX S/C	DMX512 client/server & ArtNET connectivity
	SoundGrid	(by Waves) Plug-in MY16 interface card & server
	MY cards	Interfaces for Dante, CobraNet, AES/EBU, SD/HD SDI, Optocore, Rocknet, Aviom, LightViper, SoundGrid, Tascam, Adat
	EtherSound	All EtherSound products from Auvitran, Digigram, Whirlwind, Nexo, and others.
	Video	3rd party Video over Ethernet systems from Bosch, Dlink, Sony and others
	Cabling	Touring grade CAT5 and fibre cabling using Neutrik EtherCON and OpticalCON connectivity
	Legacy	All MY16 compatible mixing consoles: 01V96VCM, 02R96VCM, DM1000VCM, DM2000VCM, LS9-16, LS9-32, M7CL-32, M7CL-48, PM5D, PM5D-RH, DSP5D.
	Control systems	Mac and Windows PC/laptops, Apple iPad, Crestron, AMX.

UNION systems components are offered by Yamaha and collaborating companies Teqsas, Neutrik, Waves, Steinberg. UNION systems can be bought as components from individual suppliers, or as turn key system through a system integrator. For more information and design support please contact a Yamaha CA sales engineer. www.yamahacommercialaudio.com

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